

The following is a description of the specimens :—

Height of body considerably more than length of head, which is one-fifth of the total length without caudal. Head depressed; its width is five-sixths of its length; eye very small; interorbital space half the length of the head; width of mouth less than that of interorbital space; labial disk well developed.

Barbels four in number, the upper nearly double the diameter of the eye. *Four and a half longitudinal series of scales between the lateral line and the root of the ventral.*

Pectoral as long as head, terminating at about its own length before root of ventral. Caudal deeply emarginate, lobes equal.

Colour silvery, darker above; a black spot behind upper end of gill-opening; tip of snout blackish; no lateral band; no darker spot at base of caudal.

Length 5 inches.

February 10, 1870.

John Gould, Esq., F.R.S., V.P., in the Chair.

The Secretary called the attention of the Meeting to the following additions to the Menagerie during the month of January :—

1. A specimen of the Great Northern Diver (*Colymbus glacialis*), captured in Cornwall, and presented to the Society by A. R. Hunt, Esq., January 6th. The bird, which was believed to be the first specimen of the species ever obtained by the Society alive, had been rather shy at first, but had been gradually induced to feed, and now seemed likely to do well. It appeared to be a bird of the year.

2. A small Armadillo, purchased January 15th of Mr. E. Paddison. This Armadillo, which Mr. Sclater referred with some doubt to the Little Armadillo (*Dasypus minutus*), was stated to have been captured on the eastern slope of the Andes of La Plata, at an elevation of 3000 feet, in 35° 15' S. lat.

3. Five Brown Tritons (*Geotriton fuscus*), from the vicinity of Spezia in Italy, purchased January 22nd, and believed to be the first specimens of this Batrachian exhibited in the Society's collection.

4. A female Potto (*Perodicticus potto*), purchased January 24th, making a pair of this scarce Lemurine form now living in the Society's collection.

The Secretary likewise reported that Mr. G. S. Rodon had presented to the Society the survivor of the two White-handed Gibbons (*Hylobates lar*) which he had deposited in the Society's Gardens on the 17th of November last—and that since the death of its fellow this animal had been placed in the same cage as the Hoolock Gibbon (*Hylobates hoolock*), presented by Mr. Grote, so that the two species might now be seen and compared together. A drawing (Plate V.) was exhibited, representing these two animals.



M & N Hanhart imp

Fig 1. HYLOBATES LAR
2 ——— HOOLOCK

The following letter, addressed to the Secretary by Mr. William H. Hudson*, was read:—

“Buenos Ayres, Dec. 14, 1869.

“MY DEAR SIR,—Probably I shall not be able to send any more birds to the Smithsonian Institution. The specimens I may find leisure to collect can be disposed of in Buenos Ayres; but should I meet with any thing new I will forward it to the Zoological Society of London. I was well pleased with your favour of November 9th, expressing your desire to see my notes on the birds I have collected; and should this letter and others I shall shortly send contain any thing of interest I shall be glad.

“Though the pampas of this part of the republic are all but entirely bare of trees, the swampy margins of the Rio de la Plata are covered with an almost impenetrable thicket from two to four miles in width. In this wood neither the thorny *Curumammel* nor the gigantic *Ambu*, that flourish on the open plains, are found; but its trees and shrubs and many of its herbs are natives of the northern states of La Plata, the Chaco, and Paraguay. The seeds have been brought from those countries by the river, or on the *Camalote*—a species of water-lily that grows round the islands of the Parana and its tributaries. These plants accumulate on the water year by year till they form vast floating islands, and are ultimately torn from their moorings by the floods, carried hundreds of miles down the river, and stranded on its low shores. These migratory islands bring with them not only the seeds of northern vegetation, but colonies of insects, reptiles, and other animals. I have known the *Ciervo*, *Jaguar*, *Aguará*, and *Carpincho*, and other large mammals, also large Serpents and Alligators, to have been thus brought down and landed within a few miles of the city of Buenos Ayres. Such large animals soon disappear; but smaller ones remain, so that in this forest Snakes and Batrachians are found of different species from those of the neighbouring plains—also insects, whose great size and gaudy colours prove their northern origin. The reptiles maintain their existence apparently within narrow limits; but many of the insects (particularly the Lepidoptera) become widely distributed, and show, by the dimmer colours and diminished size of many individuals, the modifying influences of climate and other physical conditions. The strips of vegetation stretching so far into this country from the northern wooded regions have also greatly promoted the distribution of birds.

“There are but a very few species of true ‘Pampas-birds.’ This name I apply to *Anthus correndera*, *Centrites niger*, the Red-breasted Lark (*Tæniptera*), and all those kinds especially adapted to the conditions of the Pampa. These species avoid trees, and find their subsistence, roost, and breed on the ground. But the woody fringe to the river above mentioned has served as a grand highway by which most of our small birds have been introduced into this country.

* See articles by Messrs. Slater and Salvin on Mr. Hudson’s collections (P. Z. S. 1868, p. 137, 1869, p. 158 and p. 631), and Mr. Hudson’s letter (P. Z. S. 1869, p. 432).

Thus the nearer we approach to this wood the more numerous do these species become, while in the wood itself, narrow as it is, there are many species never met with elsewhere. Possibly as many as two-thirds of all the species inhabiting Buenos Ayres are to be found within its limits.

"I obtained here many specimens of the Cuckoo to which you have called my attention (*Coccyzus cinereus*). This bird was originally discovered in Paraguay, and is considered by Dr. Burmeister to be a rare species. Perhaps it has but recently found its way to this country. Last summer (1868) I met with it for the first time; and the same year the first and only specimen ever in the museum of this city was obtained. Even within my recollection many birds and insects once seldom met with have become common. Some of our large Wasps, Weevils, and Butterflies have not been with us long; and whole orchards are at present being destroyed by the Capricorn Beetle—an insect totally unknown a few years ago.

"To return to the *Coccyzus cinereus*; the large blood-red eye of this bird, contrasting well with the soft bluish colour of the plumage, gives it a most interesting appearance. I have not yet succeeded in finding its nest. Like the common Cuckoo, it is retiring in its habits, concealing itself in the densest foliage; but it cannot be attracted like the other species by mimicking its call. It has a song (which it will sometimes repeat at short intervals for half a day) like the mourning of our little Dove, being a succession of long and plaintive notes. It has, besides, a different note—loud, harsh, and sudden, so much resembling the cry of another bird (the *Anabates lophotes*) that I have been frequently deceived by it.

"The last-mentioned bird is, I think, very uncommon in this region. The only specimen in the museum here was brought from the province of San Luis. It has the wildest disposition and greatest love of concealment, of any bird I have ever met.

"Last summer, while trying to obtain specimens, I sometimes heard the cry of an individual repeated at long intervals, or of a pair answering each other, and I frequently spent half a day vainly in watching for and pursuing them. Once only I succeeded in getting a glimpse of one at the moment it started screaming from a tree. I was, fortunately, able to secure it, and have it still in my collection. This specimen was a male; the whole plumage a yellowish brown, rather deeper than that of the Oven-bird (*Furnarius*). It is also somewhat larger than that bird. The body was stout, the head crested, the eyes were white and small, bill and legs blue. The tail-feathers were stiff, like those of the Woodpecker, and frayed at the ends, as if they had been used in the same manner; the bill was also, like the Woodpecker's, hard, sharp, and straight.

"Another bird of very interesting habits, and never seen away from the river-wood, is *Icterus pyrrhopterus*. They appear in small flocks in September, but soon scatter, and are seen during summer in pairs or singly. The male is considerably larger than the female, its colour an intenser black, the brown spot on the shoulder larger. It is exceedingly restless, incessantly flying from tree to tree, cling-



WOLF del.
J. Smith lith.

HYDROPTES INERMIS

M. S. H. Hartman





Fig 1



Fig 2

ing to the boles or branches in various attitudes, and searching with its hard curved bill for insects under the decayed bark. When thus engaged it utters a great variety of chirps and guttural sounds, interspersed with short agreeable notes. It has also a continuous song, low and varied, with a peculiar ventriloquism in some notes which gives the listener a confused idea that the performer approaches and retires when singing. The first bird of this species I shot was but slightly wounded in the wing, and fell into a stream; to my great surprise it began singing as it floated about on the surface of the water, and even when I had taken it out continued to sing at intervals in my hand. I subsequently found a nest of this bird; it was about 7 inches deep, composed entirely of lichens curiously woven together, and suspended from the twigs of a low tree. The male and female fluttered round me, manifesting great anxiety (though there were no eggs in the nest), and uttering a rapid succession of notes, very different from their usual song. But what was most surprising in this singing to express their trouble was the close resemblance of every note to those of some other bird, generally of one of our common songsters (such as *Turdus rufiventris*, *Mimus calandria*, and others). In a few days I returned to the spot to secure the nest and observe them again, but found, to my sorrow, nest and birds had disappeared. Perhaps *Icterus pyrrhopterus* possesses the faculty of imitation; at the time I heard this pair I thought it could not be otherwise, but I have not observed them long enough to be positive. Certainly they are incapable of expressing their passions by harsh or loud notes.

"I am, Sir, truly yours,

"WILLIAM H. HUDSON."

The following papers were read:—

1. On a new Deer from China.

By R. SWINHOE, F.Z.S.

(Plates VI. & VII.)

While in Formosa I was informed by a gentleman there, who had lived at the port of Chinkiang, that a Hog-backed Deer, with coarse hair, was common on an island in the river Yangtze and afforded excellent sport to the European residents during the winter. From my friend's description, I supposed the animal to be *Hyelaphus porcinus* of India, and communicated the fact to Mr. P. L. Selater, who read my notice to this Society on the 27th June, 1865 (see P. Z. S. 1865, p. 510). Last winter I had the opportunity of visiting Shanghai, and found this so-called Hog-deer in the market, and then saw it to be quite a distinct species, without horns, and of great interest. I have brought home with me the skin and skull of a buck, and the skulls of two does. These I beg to exhibit to this Meeting, and to propose for this new Deer the specific term of *inermis*, from its hornless state, and to place it under a new genus, for which

I would suggest the name *Hydropotes*, or Water-drinker, from the love of the animal for marshy ground.

HYDROPOTES, gen. nov.

General form of skull very similar to that of *Moschus*—there being no elevated ridges along the supraorbital margin, and the brain-case being narrow and somewhat elongate. *Lachrymal fossa* small, entirely confined to the lachrymal bone, the maxillary not participating in its formation. *Supraorbital foramen* situated in a groove extending further backwards than forwards, as in *Cervulus*. No prolongation of the frontal bones whatever.

The nearest allies to this genus are, as far as the cranial characters are concerned, *Pudu humilis*, of Chili, and *Moschus moschiferus*, L., of N.E. Asia. The Pudu has got a much larger and deeper lachrymal fossa, in which the maxillary participates; the distance of the lachrymal fossa from the *foramen supramaxillare* is much less than the length of the lachrymal fossa, whilst in this new genus the distance is much greater.

The affinity of this genus to *Moschus*, is shown by the fact that *Moschus* has no *lachrymal fossa* whatever—a character so general in the Deer group.

Upper canine teeth, in the male, tusk-like, as in *Moschus*, but not so developed; in the female quite small.

Incisors on the lower jaw eight, the two centrals large and flattened, the three lateral on each side smaller, graduating in size outwards; all arranged in fan-form.

Molars unfortunately not fully developed in any of my skulls, though the animals were capable of breeding at this age.

The *crania* of the females are smaller, but show no peculiarities, except in the undeveloped nature of the canine teeth above noticed.

Hair coarse and stiff, combining the characters of *Moschus* and *Pudu*, as also do the *feet*.

HYDROPOTES INERMIS, sp. nov. (Plate VI.)

Measurements taken from the stuffed skin of an animal about three-quarters grown:—Length from nose to rump 29 inches, of tail 3, of fore leg from shoulder 18, of hind leg 20, across the eye .7, across the nose .7; length of head 6.75, of ear $3\frac{1}{2}$, of canine tooth 1.1.

General colour light chestnut, stippled with black, redder on the head and back of ears. Round the nose, eyebrow, chin, and throat pure white. Inside of ear light buff, whiter near base; its outer edge, at tip, black. Neck paler, its under portion plain-coloured. Shoulder, fore and hind legs, and tail light brownish chestnut. Belly pale buff-white. The chestnut colouring of the upper parts deepens along the back and pales downwards on the sides.

The hair of the nasal region very short. At the corner of the lower lip springs a tuft of stiff white hairs. Bristles about the muzzle short and few. Eye small. Ears well clothed inside. Hair coarse and stiff, of the neck and rump the longest. Each hair of

the upper body is flattened, and undulates from side to side, or is zigzag in its length, giving it in some views quite a spiral appearance. I notice the same peculiarity in the corresponding hair of the *Moschus*. Each of these hairs in our animal is white from its base for the greater part of its length, then blackish brown, ending with a light chestnut tip; thus, the hairs overlapping each other, the chestnut tips give the general ground-colour, and the blackish rings the stippling.

Fore leg. Length of hoof in front 1·25, breadth of each segment ·75; length of hind toe ·75, its breadth ·45, raised about ·75 above the sole of the foot.

Hind leg. Length of hoof 1·18, breadth of each segment ·63; length of hind toe ·60, its breadth ·45, raised above sole of foot 1·30.

The above description is taken from a buck bought in the market at Shanghai on the 30th November 1868, and consequently in its winter coat.

In coloration and outward appearance the little *Pudu* comes much nearer to our species than does the bristly-looking brown *Moschus*. It is also chestnut-coloured, stippled with black and red on the head and ears; but its rump and tail are red (which are not so in our animal), and the male carries horns. Dr. Günther has kindly assisted me in working out the affinities of this animal.

In the large riverine islands of the Yangtze above Chinkiang these animals occur in large numbers, living among the tall rushes that are there grown for thatching and other purposes. The rushes are cut down in the spring; and the Deer then swim away to the main shore and retire to the cover of the hills. In autumn, after the floods, when the rushes are again grown, they return with their young and stay the winter through. They are said to feed on the rush-sprouts and coarse grasses, and they doubtless often finish off with a dessert from the sweet-potatoes, cabbages, &c. which the villagers cultivate on the islands during winter. They cannot, however, do much damage to the latter, or they would not be suffered to exist in such numbers as they do; for the islands have their villages and a pretty numerous agricultural population. Fortunately for the Deer, the Chinese have an extraordinary dislike for their flesh. I could not ascertain why; but it must be from some strange superstition, as the Celestials are otherwise pretty nearly omnivorous. The Deer are killed only for the European markets, and sold at a low price. Their venison is coarse and without much taste, but is considered tolerable for want of better; it is the only venison procurable in Shanghai. The animal itself gives sport to the gunner; and numbers are slaughtered every winter by the European followers of Nimrod, in the name of *sport*. Their numbers, however, do not appear to get much thinned; they are reported to be very prolific breeders. A friend of mine assured me that he witnessed the gutting of a female that was shot by one of his party on a late excursion, and that she was found to contain *six* embryo young. This single fact, however, is not sufficient to establish the ordinary gestation of this species; on the contrary, it was probably an extraordinary case; but it was the only

instance I could get of a pregnant specimen having been examined. The large number of immature animals usually seen in a herd of them seems to show that they have some means of reproducing not common to other Deer.

On my cruise up the river Yangtze with Admiral Sir Henry Keppel last year in H.M.S. 'Salamis,' we called at Chinkiang, and, taking on board some of the residents at that port, steamed a few miles further up, and landed at Deer Island for a little shooting. A goodly party of officers and others were with us, and the Deer were well disturbed that day; no bullets were allowed, for fear of accidents, and only fowling-pieces used with large shot. A large patch of rushes still stood, and there were plenty of Deer; but only *eight* were brought back to the ship, though doubtless many more were injured. They crouch in the reeds and long grass, admitting pretty close approach, and then, rising with a bound, spring away. They were generally put up singly or in twos and threes. In running they cock their ears, round their fore legs, bend up their hind legs, hog their rumps, and scurry away with little quick leaps, very much after the manner of a Hare. The heavy shot soon bowled them over. When they ran across the cultivated fields, the Chinese shouted after them and set their barking curs to pursue them.

The Chinese at Shanghai call this animal the *Ke*; but at Chinkiang they are named *Chang*—the classical term for the Muntjac (*Cervulus reevesi*). The Chinese dictionary compiled under authority of the Emperor *Kanghe* describes the *Ke* as "Stag-like, with feet resembling those of a Dog, has a long tusk on each side of the mouth, and is fond of fighting."

EXPLANATION OF THE PLATES.

PLATE VI.

Hydropotes inermis.

PLATE VII.

Fig. 1. Skull of male *Hydropotes inermis*.

2. Skull of female *Hydropotes inermis*.

2. On the Size of the Red Corpuscles of the Blood of *Moschus*, *Tragulus*, *Orycteropus*, *Ailurus*, and some other Mammalia, with Historical Notices. By GEORGE GULLIVER, F.R.S.

Measurements, Scale, and Woodcut.—The present, like all my former measurements, are given in vulgar fractions of an English inch. Of the scale to the woodcut each division of one-fifth of an inch is equivalent to one four-thousandth of an inch micrometrical or linear admeasurement, being the same scale as that to which the figures are engraved in the reports of my lectures, in the 'Medical

Times and Gazette' from August 1862 to December 1863, and in the 'Proceedings' of this Society for February 25, 1862.

In the subjoined woodcut are represented dried red blood-disks of four Mammalia, to wit:—1. *Tragulus javanicus*; 2. *Moschus moschiferus*; 3. *Cervus alces*; 4. *Orycteropus capensis*. Figures 1 and 4 show specimens of the smallest and largest of these corpuscles yet known among Mammalia; and figures 1, 2, and 3 some marked differences in the size of the corpuscles of Ruminantia.

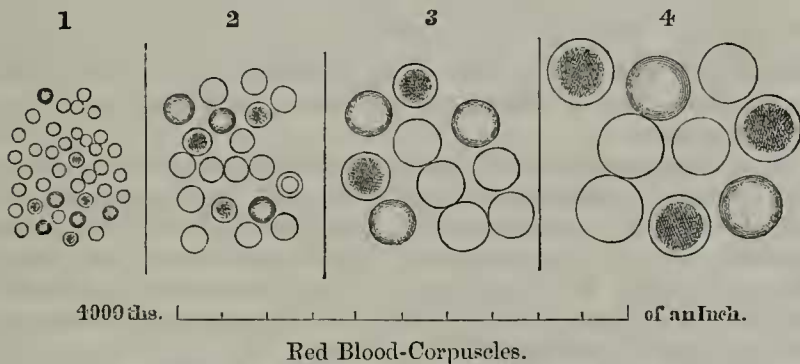


Fig. 1. *Tragulus javanicus*.
2. *Moschus moschiferus*.

Fig. 3. *Cervus alces*.
4. *Orycteropus capensis*.

Moschus moschiferus.—Through the courtesy of Professor Flower, I have examined the blood of the female of this species that died at the Zoological Gardens on the 26th of October, 1869; and the result affords an interesting complement to or illustration of my original observations on the blood-disks of Tragulidæ and some other Ruminants. Their mean size in *Cervus alces* is $\frac{1}{3938}$ of an inch.

Of the blood-disks of *Moschus moschiferus*, the report to him of my examination was to the effect that this species appeared to be no near relation to those three "Musk-deer" of which I had formerly examined the blood, that *M. moschiferus* could hardly belong to the same genus as that which includes those three species, and that there was no appreciable difference of size between the blood-disks of *M. moschiferus* and those of *Cervus nemorivagus*.

From thirty-one measurements of the red blood-corpuscles of *Moschus moschiferus* their average diameter was found to be $\frac{1}{7060}$ of an inch; and an independent measurement by Professor Flower and Mr. Moseley made them closely of the same size. The extreme sizes observed by me were $\frac{1}{8888}$ and $\frac{1}{5333}$ of an inch. And thus, with this animal, the Ibex, Brocket-deer, and *Tragulus*, my observations show that we have three or four genera at present known with blood-disks smaller than those of the Goat.

Though these corpuscles of *Moschus moschiferus* are so small as at once to declare the Ruminant order to which this animal belongs, they may be seen at a glance to be at least a third larger than those of *Tragulus*, and little more than half the size of the blood-disks of *Cervus alces*. And how close is the correspondence in this respect

between these corpuscles of *Moschus moschiferus* and those of *Cervus nemorivagus* will appear by a comparison of fig. 2 in the above woodcut with fig. 7 in the 'Proceedings' of the Zoological Society above cited. In *M. moschiferus* none of the blood-corpuscles presented those curious and irregular shapes which I have described and figured in certain Cervidæ (Lond. and Edin. Phil. Mag. Nov. 1840, and Proc. Zool. Soc. Feb. 25, 1862, fig. 7).

Tragulus.—The average diameter of the blood-disks of *T. javanicus* and *T. meminna* is $\frac{1}{12,325}$ of an inch, and the extreme sizes $\frac{1}{16,000}$ and $\frac{1}{9600}$ of an inch; and of *T. stanleyanus* the average size of the corpuscles is $\frac{1}{10,825}$ of an inch. These measurements of the smallest known blood-disks of Mammalia are here quoted from my Tables for comparison.

Orycteropus capensis.—Not long after the death of the true Musk-deer died an *Orycteropus* and *Ailurus*; and I am also indebted to Prof. Flower for an opportunity of examining the blood of these two animals. We made a cursory examination together of their blood-disks, and easily saw that those of *Orycteropus* were much the largest. But the power of the instrument then used was insufficient, and I completed the examination at home.

After my discovery of the large size of the red blood-corpuscles of *Myrmecophaga* and *Bradypus* (Proc. Zool. Soc. June 11, 1844, and Jan. 24, 1854), the similar magnitude of the corresponding corpuscles of *Orycteropus* was expected; and they are certainly among the largest known in Mammalia. From many measurements the average diameter of the red blood-corpuscles of *Orycteropus capensis* proves to be no less than $\frac{1}{2769}$ of an inch, with many gradations between the few two extremes of one-third smaller and one-third larger than the average size. Such varieties of size are common in the blood-disks of single species throughout the Vertebrate subkingdom. The red blood-corpuscles of *Orycteropus* are so nearly of the same size as those of the Elephant and *Myrmecophaga* that it would be difficult to distinguish these three animals by their blood-disks, as will appear by comparing fig. 4 of the above woodcut with figs. 6 and 9 in the Proceedings of the Zoological Society for Feb. 25, 1862.

Ailurus fulgens.—The average size of the blood-disks is $\frac{1}{3764}$ of an inch, thus nearly corresponding with those of *Procyon*, *Nasua*, and *Meles*; but its next neighbour, *Cercoleptes*, in the zoological systems, has blood-disks so much smaller as to indicate that it may be but an aberrant member of that family which includes *Ailurus*.

Import and Relations of the Size of the red Blood-corpuscles.—Previously to my researches it was commonly said, after Hewson, that the size of the blood-disks has no relation to that of the species—and truly, if regard be had only to such different animals as the Mouse and Horse. But my measurements clearly proved that there is so far such a relation in Mammalia of one natural order or family that the smallest blood-disks occur in the small species and the largest blood-disks in the large species of that order or family. Among Rodents, *e. g.*, I discovered the largest blood-disks in the great

Capybara, and the smallest in the tiny Harvest-mouse; while in the whole class of Birds the rule in this respect, in conformity with the comparative uniformity of their general organization, proved to be like that rule for a single order of Mammalia. On the contrary, with such greater divergences of general organization as occur in Reptiles and Fishes there are corresponding diversities in the blood-disks.

And the present observations conform to this view as to the size of the red blood-corpuscles in a mammalian order. Among Ruminants the woodcut shows these corpuscles smallest in the diminutive *Tragulus*, larger but still small in the bigger *Moschus*, with much increase of size in the great Moose-deer. And they are largest of all in the biggest Edentata, so that this order is now proved to be characterized by larger blood-disks than have yet been found in as many different genera of any other order of Mammalia.

In many species of different orders there may be such a near approximation in the size of the corpuscles as to make them worthless as diagnostics between one order and another. For example, some of the larger Ruminants could not be distinguished by this character from several *Feræ*. In the Seal, indeed, these corpuscles are about the same size as in Man, and only slightly smaller in the Otter and Dogs; but in the *Paradoxures* and *Viverras* the blood-disks are not larger than in the Wapiti, Elk, and Sambur Deer, and in the Au-rochs and other Oxen.

But in closely allied and true members of a single natural family the characters of the blood-disks, as already shown, may afford an excellent diagnostic between that and another family. In such a family the blood-disks are so much alike that their size, *cæteris paribus*, is only largest among the big species and smallest among the little species. Shortly after the discovery by M. Mandl of the oval shape of the red blood-corpuscles of the Dromedary and Paco, I confirmed it, and discovered that these corpuscles have the same shape in all the other members of this family—also that, notwithstanding the oval figure of these blood-disks, they resemble those of other Ruminants in structure and size, and by no means approach in either of these respects to the oval corpuscles of pyrenæmatous vertebrates (Med. Chir. Trans. Nov. 26, 1839, vol. xxiii.).

But when the blood-disks of one species differ remarkably in size from those of several other species of a single natural family, that species, *cæteris paribus*, is likely to be an aberrant one in its general organization. All my observations support this view, as is exemplified by *Hyrax capensis*, *Bassaris astuta*, *Cercoleptes caudivolvulus*, and other Mammalia. And we have already seen that *Moschus*, if still included with *Tragulus*, would be an equally remarkable instance. Again, my discovery of the singular minuteness of the blood-disks of Tragulidæ would indicate that this is really a distinct natural family, though I know not that we have any other group of equally small Ruminants for comparison.

The opinion that the size of the blood-disks is connected with the kind of food on which the animal lives has never been confirmed.

This is one of Professor Owen's views,—a "generalization" from a preposterous insufficiency of observations. After informing us that the rule is generally applicable to the placental and marsupial Mammalia, he adds that, "the blood-disks of the marsupial species which derives its nourishment from the greatest variety of organized substances, as the *Perameles*, which subsists on insects, worms, and the farinaceous and succulent vegetables, are larger than those of the (Spotted) carnivorous Dasyure, and those of the herbivorous Kangaroo, the blood-disks of the latter, like those of the placental Ruminant, being the smallest" (Lond. Med. Gazette, Dec. 20, 1839, p. 475). How completely this view is at variance with the facts may be seen in my Tables of Measurements, of which he sometimes quotes the French translation by Prof. Milne-Edwards. The blood-disks are largest of all in the Elephant, a purely vegetable feeder, and in the Edentates, which do not subsist on the greatest variety of organized substances; while among Marsupials there are some species living on one kind of food, the Ursine Dasyure, *e.g.*, that have larger blood-disks than those of the more omnivorous *Perameles*. They are larger in the piscivorous Seals and Otter than in the Pig, an animal well known to subsist on quite as great a variety of organized substances as the *Perameles*; while the blood-disks of the Pig are not larger than those of the Tapir, Rhinoceros, and Ass, three other Pachyderms and well-known vegetable feeders. And similar examples are afforded by Birds and lower Vertebrates.

No wonder, then, that a writer entertaining such opinions as to the food and blood-disks should embrace the additional error that their gradations of size are "insignificant" or "unimportant."

But, notwithstanding his conclusions, the truth is that this question of size is both significant and important. In systematic zoology we have already seen that the size of the corpuscles frequently affords a good diagnostic, both of one order from another and between genera or species of a single order or family; as I have more fully shown in the Appendix to Gerber's 'Anatomy,' in the Notes to Hewson's Works, in various numbers of the 'Philosophical Magazine' from 1839-42, in the second volume of the 'Journal of Anatomy,' and still further in the 'Proceedings' of the Zoological Society—with illustrative engravings in the volume for 1862 (p. 91), and in the 'Medical Times and Gazette' from August 1862 to December 1863. And in a physiological point of view the size of the blood-disks is still more important and significant in relation to respiration and animal heat, as described in Lecture IX., reported in the 'Medical Times and Gazette' for January 17, 1863, and in the abstract of another of my lectures in 'Scientific Opinion' for December 8, 1869.

Indeed a field of experimental inquiry is thus opened which will surely yield a rich harvest when properly cultivated. What, for example, is the precise relation of animal heat to the proportion of the whole blood to the body? What is the relation of that heat to the proportionate quantity or aggregate bulk of the blood-disks to the other parts of the blood? How far is the animal heat affected, *cæteris paribus*, by the size of the blood-disks? I know of no exact

experiments relating to these points, save the few valuable but fragmentary ones of that eminent physiologist the late John Davy. In short, the relation of animal heat to the size and proportion of the red corpuscles of the blood still requires an ample and careful set of experiments. From all that is at present known it appears that, *cæteris paribus*, the smaller these corpuscles the greater will be the heat of the animal, since a minute subdivision of a given bulk of them will afford a corresponding increase of their aggregate surface for the transit of oxygen. The comparative smallness of the blood-disks of the diminutive species of a family of Mammals and of the class of Birds may be a provision against the greater proportionate loss of heat in the little members of such family or class.

Dr. Davy has shown that warm-blooded fishes have a large proportion of blood and red corpuscles, while that proportion is remarkably less in fishes that are but little warmer than the water in which they live. And to this excellent observer we are indebted for precise experiments on the increase of the heat in Man when the circulation of the blood is hastened through the lungs and body. The warmth of the Python during incubation at the Society's Gardens, as shown by the important observations of Dr. Sclater (Proc. Zool. Soc. 1862, p. 365), was probably due to accelerated circulation of the blood, and increased chemical action connected therewith, as in a fever. In one of his interesting experiments, Dr. Sclater found the temperature of the female Python as high as 96° , and of her male mate 76° , while the air of their den was only 60° . Such facts, with Dr. Davy's discovery of the regular warmth of certain Fishes, as much invalidate Prof. Owen's distinction of "*Hæmatocrya*" and "*Hæmatotherma*," as, according to his statement, the air-cavity of the humerus of the Pterodactyle "breaks down" Cuvier's distinction of Birds from Lizards by the air-passages in the bones.

Historical Notices.—The records of discovery concerning the constituents and properties of the blood make but a sorry chapter in its written history, and one, indeed, that had better remained unwritten than overwhelmed, as it was, with confusion and injustice. In the Introduction and Notes to Hewson's works, it was part of my duty to correct Prof. Owen's contributions to such mistakes; and I now regret that the common truth of a branch of physiological history and my own just claims still require vindication from his pretensions and the indiscreet zeal of his friends.

The early tables of measurements by Prevost, Dumas, or others, exemplified the smallness of the blood-disks of Ruminants in those of the Sheep, Goat, or other members of the order. And the red blood-corpuscles of the Goat were the smallest known before my discovery, read at the Med. Chir. Soc. Nov. 26, 1839, of their singular minuteness in *Tragulus*; while my measurements thereof, and of the blood-disks of the Camels and several other Ruminants, and of the Marsupials, were, as then noted by the Editor, communicated to the '*Philosophical Magazine*' just three days previously. Yet these plain truths are always suppressed by Prof. Owen in order to support his own pretensions to the discovery and his amusing

declaration that "This generalization has not been affected by later observations."

He does not scruple to borrow without acknowledgment from my Tables of Measurements (Comp. An. ii. 184); though hinting more than once that they are "insignificant" or "unimportant," and this under cover of references to the French translation of them by Milne-Edwards and not to my own original version.

Indeed, to this illustrious physiologist Prof. Owen refers on this question, as both Milne-Edwards and his son Alphonse Milne-Edwards have been moved to make the emphatic assertion that the minuteness of the blood-disks of *Tragulus* was discovered by Prof. Owen. But this is a misstatement, as the very reference made in its behalf, to the 'London Medical Gazette,' 1839-40, will prove. A careful search throughout those volumes, not excepting the curious zoologico-anthropological characteristics in the "Extra Limites," vol. ii. p. 671*, will fail to find mention of more than a single *Tragulus*; and that occurs, with his first notice of the blood of Camels, in the number for December 20, 1839: all the few measurements in that paper were by Mr. Bowerbank; and "*Moschus pygmæus*" is the only *Tragulus* mentioned therein.

But, as Prof. Owen has long since well known, my observations on the minuteness of the blood-disks of *Tragulus*, on the shape and size of those of certain Camels, and on their structure in this whole family, were read, as before said, at a meeting of the Medico-Chirurgical Society on the 26th of November previously, published in the 23rd volume of the Transactions of that Society, and, with my description of the same corpuscles of Marsupials, in the 'Dublin Medical Press' of November 27, in the 'London and Edinburgh Philosophical Magazine' of December 1, all of the same year, and in several other periodical works either of the first day of December, or at least before the date of Prof. Owen's paper. And of his acquaintance with my paper that had been read at the Medico-Chirurgical Society on the 26th of November, he has left published proof in a footnote to his own paper of the succeeding 20th of December, in which he quotes mine of the preceding 26th of November as to the lymph-globules of *Tragulus* and the Camels, but omits any notice of my description therein of the blood-disks of those animals; only he says that the minuteness of the blood-disks of *Moschus pygmæus* is such as he "had anticipated;" and so, no doubt, he had, with my published proof of that minuteness before him.

In the foregoing notices an attempt has been made to assert the truth respecting a branch of physiological history to which the best part of my life has been devoted. Should it be supposed that I have now been influenced only by considerations personal to myself, I can but truly deny the imputation, and refer in proof to my published writings, in which quite as much zeal has been shown in defending the rights of Davies, Hewson, and others from unjust aggression as I have here exercised in behalf of my own just claims. Had private persons been the authors of the errors now corrected, they might have passed, like several similar ones, without notice; but Professor

Milne-Edwards is one of the most eminent comparative anatomists and physiologists in Europe, and Professor Owen is the Superintendent of the Natural-History Departments of the British Museum.

3. On the Freshwater Fishes of Burmah.

By FRANCIS DAY, F.Z.S., F.L.S.—Part II.*

OPHIOCEPHALUS AUROLINEATUS, sp. nov.

D. 53. P. 18. V. 6. A. 36. C. 14. L. l. 66. L. tr. $\frac{6\frac{1}{2}}{14}$.

Length of head nearly $\frac{1}{4}$, of caudal $\frac{2}{13}$, height of body $\frac{2}{13}$ of the total length.

Diameter of eyes $\frac{1}{5}$ of length of head, 1 diameter from end of snout, $1\frac{1}{4}$ diameter apart.

The posterior extremity of the maxilla extends to below the posterior margin of the orbit. Thirteen rows of scales between the orbit and the angle of the præopercle. Shields on top of head of moderate size.

Teeth numerous, villiform, in jaws, vomer, and palate.

Colour dark purplish black, with an orange stripe commencing at the snout and passing through the eye along the side and above the lateral line to the upper half of the tail.

Hab. One specimen, $3\frac{7}{10}$ inches, was taken at Moulmein. Although the natives asserted it to be a common species, a second specimen was not obtained. It may prove to be the young of the *O. marulius*, H. B., from which, however, it appears to differ considerably.

LABEO NEILLI, sp. nov.

B. iii. D. $\frac{2-3}{15-16}$. P. 15. V. 9. A. $\frac{2}{5}$. C. 19. L. l. 34. L. tr. $\frac{5\frac{1}{2}}{6\frac{1}{2}}$.

Length of head nearly $\frac{1}{5}$, of caudal $\frac{1}{4}$, height of body $\frac{2}{7}$, of dorsal fin $\frac{1}{8}$ of the total length.

Eyes. Diameter $\frac{2}{7}$ of length of head, $1\frac{1}{2}$ diameter from end of snout, 2 diameters apart.

Snout rounded and smooth, it scarcely overlaps the mouth, which is of moderate width; no lateral lobe; lips thin, only slightly reflected, they are both fringed with two, three, or more rows of well-developed papillæ internal to the outer fringe. The rostral barbels do not reach the orbit; the maxillary extend to beneath its centre. Body compressed.

Fins. The dorsal arises before the ventral, and much nearer the snout than the base of the caudal, which latter is deeply forked. Upper margin of dorsal slightly concave.

Teeth pharyngeal, 5, 4, $\frac{3}{3}$, 4, 5, plough-shaped.

Scales. Four and a half rows between lateral line and the base of the ventral fin.

Gill-rakers very short.

* For Part I. see P. Z. S. 1869, p. 614.

Colours. Greyish yellow, darkest above, every scale having a dark spot at its base. Fins yellowish orange; dorsal darkest in its lower half, a darkish spot near the root of the caudal fin, and another, ill-defined one at the commencement of the lateral line.

Hab. Sittoung and Billing, whence I procured seven specimens up to six inches in length. I have named the species after my esteemed correspondent A. B. Neill, Esq., F.Z.S.

BARBUS (BARBODES) STEVENSONII, sp. nov.

B. iii. D. 3/9. P. 17. V. 9. A. 3/5. C. 19. L. 1. 27. L. tr. $4\frac{1}{2}/5$.

Length of head $\frac{2}{3}$, of caudal nearly $\frac{1}{4}$, height of body $\frac{2}{9}$ of the total length.

Eyes. Diameter $\frac{2}{7}$ of length of head, 1 diameter from end of snout, 1 diameter apart.

Body elongated, compressed. Dorsal profile but little elevated.

Interorbital space flat. Upper jaw longest. Maxillary barbels extending to below the posterior margin of the orbit; the rostral ones are shorter.

Fins. The dorsal arises before the ventral, and midway between the snout and the base of the caudal; its third undivided ray is smooth, weak, and articulated in its whole extent; the fin is slightly lower than the body. Caudal forked.

Scales. Two and a half rows between the lateral line and base of the ventral fin.

Colours. Silvery; a black spot at the base of the caudal.

Hab. Akyab. Given to me by Col. Stevenson amongst several other species; and I have named it after its discoverer.

BARBUS (PUNTIO) PUNTIO, H. B.

B. iii. D. 3/8. P. 15. V. 9. A. 2/5. C. 21. L. 1. 23. L. tr. 4/4.

Length of head $\frac{1}{4}$, of caudal $\frac{2}{7}$, height of body nearly $\frac{1}{3}$ of the total length.

Eyes. Diameter $\frac{2}{5}$ of length of head, $\frac{3}{4}$ of a diameter from end of snout, 1 diameter apart.

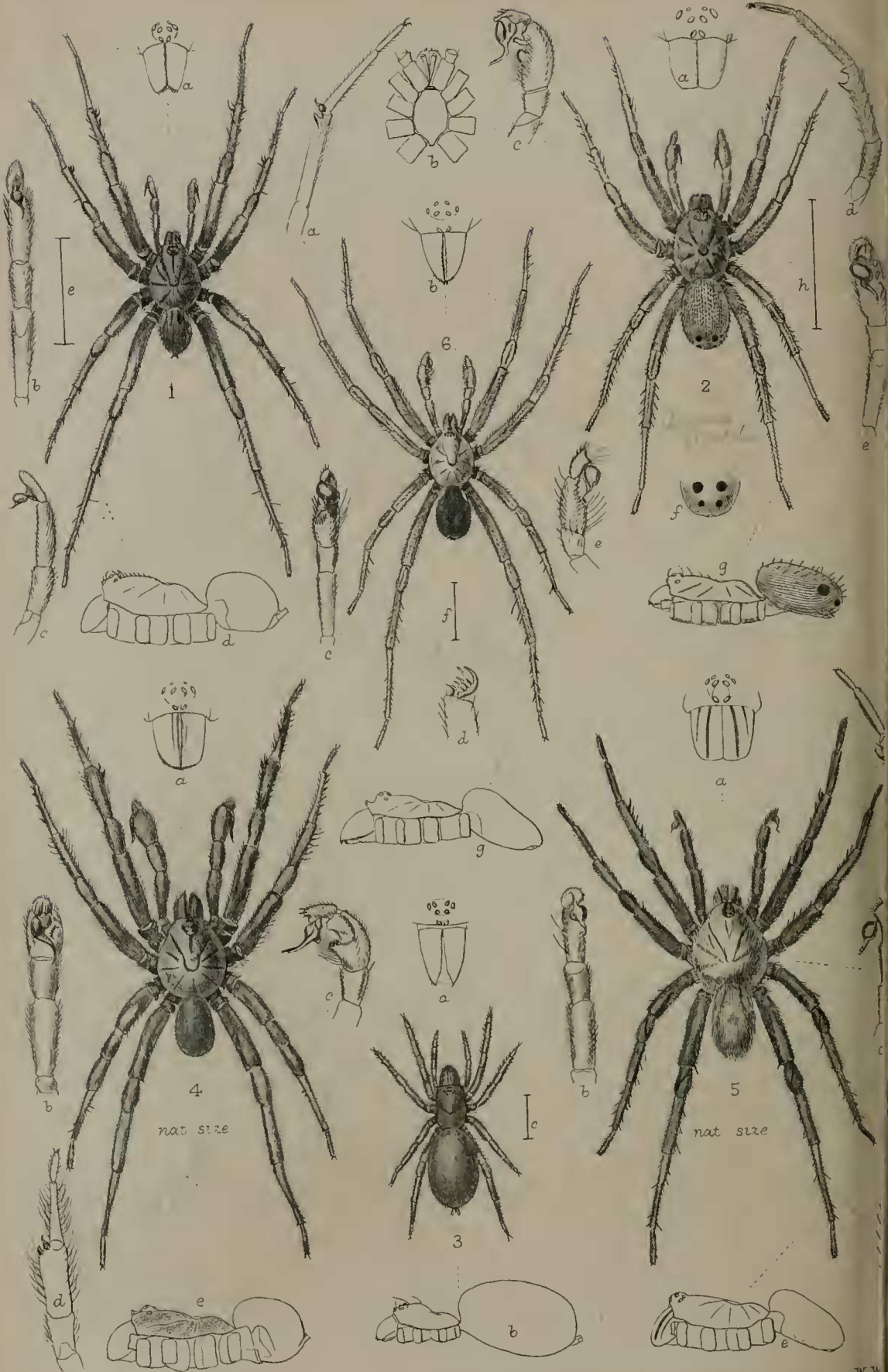
Mouth small, destitute of barbels. Dorsal profile rises to the origin of the dorsal fin.

Fins. Dorsal commencing midway between the anterior margin of the orbit and the base of the caudal, rather in advance of the ventrals; its third undivided ray is smooth, weak, and articulated. Caudal deeply forked.

Lateral line incomplete, only extending along a few scales. Two rows and a half of scales between it and the base of the ventral fin.

Colours. Silvery; a deep wide black band encircles the free portion of the tail, and includes the tip of the anal. Dorsal fin orange tipped with black.

Hab. Five specimens captured at Sittoung. I have redescribed the species, as its existence has been doubted, apparently not having been taken since Hamilton Buchanan's time.



SEMILOTUS MODESTUS, sp. nov.

B. iii. D. 4/20. P. 15. V. 9. A. 3/6. C. 19. L. 1. 32-34.
L. tr. $7\frac{1}{2}/7\frac{1}{2}$.

Length of head $\frac{2}{3}$, of caudal $\frac{2}{9}$, height of body nearly $\frac{1}{3}$ of the total length.

Eyes. Diameter $\frac{1}{3}$ of length of head, 1 diameter from end of snout, $1\frac{1}{2}$ diameter apart.

Snout broad, obtuse, with several open pores on either side. Mouth transverse, inferior. The posterior extremity of the maxilla extends to beneath the middle of the orbit. No horny substance on the jaws. Lower jaw not covered by lip. A knob at the symphysis. Slight motion between the maxillary and intermaxillary bones. No barbels.

Teeth pharyngeal, 4, 3, $2\frac{1}{2}$, 3, 4.

Colours. Silvery, darkest in the upper half of the body. Ventrals and anal tipped with orange.

Hab. Hill-ranges of Akyab, whence Col. Stevenson procured for me two specimens, of $4\frac{1}{2}$ and $5\frac{1}{2}$ inches respectively in length.

Remarks.—This species appears intermediate between the genera *Semiplotus* and *Cyprinion*; for it nearly agrees with the former in the slight motion of the upper jaw, absence of barbels, &c., whilst it likewise resembles the latter in having a serrated dorsal spine, although it has no horny edge to the lips or barbels. However, those two genera, with this intermediate species, appear to pass so naturally one into the other that I would suggest they should only be regarded as subgenera.

4. Monograph of the Genus *Idiops*, including Descriptions of several Species new to Science. By the Rev. O. P. CAMBRIDGE.

(Plate VIII.*)

In publishing descriptions of new species of a little-known genus, it seemed a fit opportunity to incorporate with them the substance of what has already been made known upon the subject by Continental arachnologists; the present paper will therefore comprise the characters of the genus, and of the only two species of it hitherto known, in addition to the descriptions of the new species.

The genus *Idiops* was first characterized (in 1830) by M. Perty (Del. An. Art. Bras. p. 197); but it appears to have been overlooked by Baron Walckenaer, who seems to have hastily concluded M. Perty's spider to have been a species of the genus *Sphasus* (see Walck. Ins. Apt. tom. i. p. 379, Paris, 1837). It is surprising that Walckenaer should not have recognized in M. Perty's figures and lucid description a species of a new and well-marked genus of the family

* For description of this Plate, see the end of the supplementary paper on the same subject, below p. 157.—Ed.

Mygalides. Subsequently M. Guérin-Méneville (without any reference at all to the genus established by M. Perty) founded the genus *Acanthodon* upon another Spider, undoubtedly congeneric with that upon which the genus *Idiops* had been previously established (see 'Arachnides du Voyage de la Favorite,' and 'Revue Zoologique,' 1838, p. 10). This genus, *Acanthodon*, was afterwards, in the Supplement to his history 'Des Aranéides,' included in 'Ins. Apt.' tom. ii. p. 234, by Baron Walckenaer, who also seems to have overlooked its identity with *Idiops*. Since that time nothing appears to have been published upon it. The present occasion, therefore, seems a fit one for the re-establishment of M. Perty's genus, and the rectification of the erroneous reference to his species by Walckenaer in the work above quoted (Ins. Apt. tom. i. p. 379, where the specific name of Perty's Spider is also erroneously given as *Idiops aculeatus*, whereas the name given it in Del. An. Art. Bras. is *Idiops fuscus*).

Of the species* which are now included in the genus *Idiops*, three (*Idiops fuscus* (Perty), *I. kochii*, n. sp., *I. petiti* (Guérin)), are from two widely separated localities in South America (Brazil and the Amazons); the fourth (*I. sigillatus*, n. sp.) is from the Swan River, West Australia, and in many respects a most remarkable species; the fifth is from Beirût in Syria.

Fam. MYGALIDES.

Gen. IDIOPS.

Idiops, Perty, Del. Anim. Artic. Bras. p. 197, 1830-34.

Acanthodon, Guérin, Arachnides du Voyage de la Favorite, cl. viii. pl. 16. figs. 1-8; Revue Zool. 1838, p. 10; Walck. Ins. Apt. tom. ii. p. 234.

Characters of the Genus.—*Cephalothorax* large, oval, in some species uniformly convex above; in others the caput is more or less elevated, and the sides as well as the thoracic portion depressed.

Eyes unequal in size and disposed in three transverse rows, 2, 2, and 4; this last row, the hindmost, is much the longest, curved, and not far behind the second, or intermediate row; while the foremost one is placed at a considerable distance in front, and only just above the insertion of the falces; they may also be described (see Guérin, *l. c. sup.*) as disposed in two groups,—the *first* placed on the anterior margin of the cephalothorax, and composed of two eyes near to each other; the *second* considerably behind and forming a longish narrow transverse oval figure, composed of six eyes.

Falces strong, prominent, and generally armed at their extremities on the upperside with a group of short strong spines.

Maxillæ cylindrical, divergent, almost entirely destitute of any prominence on their inner extremities, so that (like many others of the *Magalides*) the palpus appears to spring from the very extremity of the maxilla.

* *Vide* supplementary notice, in which other new species are described, *postea*, p. 152.

Labium small, oblong, rather narrower at the apex than at the base.

Legs strong, variously armed with spines, and terminating with three claws, the two superior ones of which are sometimes pectinated.

Palpi long, strong, and armed with spines; in the female sex pediform, and ending with a simple curved claw; in the males terminating with palpal organs, which in general structure resemble closely those of the male sex in all known species of the *Mygalides*, viz. a corneous bulb slightly attached to the underside of the digital joint, and prolonged into a variously formed, but generally simple, spinous projection.

M. Guérin remarks that nothing is known of the habits of his species *I. petitti*; the striking similarity, however, in one portion of its structure (viz. the strong and peculiar spines on the palpi, legs, and falces) seemed to indicate a *habitus* similar to that of *Cteniza*, Latr., *Atypus* (Latr.), and *Actinopus* (Perty), i. e. the formation of a tubular silken domicile in a hole dug out of the earth, and closed probably by a hinged lid: this habit has been verified in respect to one of the new species described below (*I. syriacus*); and thus M. Guérin's concluding observation, "Elle doit être fousseuse comme certaines *Mygales* et comme les *Atypes*," has received a striking confirmation in fact.

1. IDIOPS FUSCUS.

Idiops fuscus (*Filaria mygaloides*), Perty, Del. An. Art. Bras. p. 197, pl. 39. f. 5.

Sphasus idiops, Walck. Ins. Apt. tom. i. p. 379.

Male adult, length $4\frac{1}{2}$ lines.

Cephalothorax suboval, but slightly convex above.

Eyes eight, unequal in size; two small ones situate in front, then two of larger size, and behind these four small ones, placed in a curved line.

Legs long, rather strong, attenuate towards the tarsi; relative length 1, 4, 2, 3.

Palpi almost as long as the cephalothorax and abdomen, first joint forming the maxillæ, last joint in the male inflated and unguiculate.

Abdomen oval; sternum small, flat, subcircular. The whole spider is of a dusky black colour; the coxæ of the legs testaceous; tarsi red. At first sight similar to "*Actinopus tarsalis*," but in structure and position of the eyes wholly dissimilar; on the underside the colour is testaceous brown.

Hab. Brazil.

In the above description, M. Perty omits a strong specific character, well shown in the figure, viz. the strong and tumid radial joints of the palpi.

2. IDIOPS KÖCHII, n. sp. (Plate VIII. fig. 1.)

Male adult, length $7\frac{1}{2}$ lines.

Cephalothorax large, oval, transversely truncate before, and moderately convex above; the lateral and posterior margins of the caput are